

## Section of Neurology

President J D Spillane MD

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### Paper

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#### The History of the Neurological Sciences

by Edwin Clarke MD MRCP

*(Sub-Department of the History of Medicine,  
University College,  
London)*

The history of the neurological sciences is a vast field which, apart from a few small areas, has not been examined in any detail. As is the case with the evolution of other medical sciences this must in essence be a study of the development of scientific and social concepts, taking into account the multifold factors likely to influence them. The object of this paper is to point out a few of the more obvious lines of research in this important subject.

In the preclinical sciences, investigations into the history of neuro-anatomical and neuro-physiological topics have not been extensive. In the case of the former, a simple yet basic necessity is a list of terms and their meanings at various periods in history. 'Medulla oblongata', for example, which to us refers to a part of the brain stem, in the seventeenth century included basal ganglia, brain stem and spinal cord (Clarke 1968a). The various ways in which the brain has been depicted are an important aspect of anatomical iconography which will repay more detailed study, especially the medieval illustrations, which represent the 'cell doctrine', a speculative concept of intraventricular psychological activity (Sudhoff 1914). The convolutions of the brain set another interesting problem because their history is one of the longest of any anatomical structure; they were identified first by the Ancient Egyptians (Clarke & O'Malley 1968). The more recent developments, partially reported by Schiller (1965), make

important links with pre-Darwinian evolutionary theory but are as yet uninvestigated. Regarding the gross anatomy of the nervous system, there are many other historical problems and this is also true in the case of neurohistology. The evolution of the neurone doctrine has of course received attention recently (Andreoli 1961, Clarke & O'Malley 1968) but a considerable amount of work remains. In some instances the method of 'practical history' which attempts to recreate experimental situations with the help of instruments and techniques contemporary with the earlier investigator is of use. In selected cases this can provide the historian with a new dimension to supplement the written and illustrative data already available but perhaps inadequate. It proved invaluable in the elucidation of Aristotle's curious remarks about the brain (Clarke & Stannard 1963) and its use to prove conclusively that Malpighi was not the first to describe the nerve cell as all historians claim has been reported (Belloni 1966, Clarke & Bearn 1968); an elucidation of the first account of the nerve fibre using this technique is proceeding. A historical analysis of the contributions made to neurohistology by the electron microscope, both the transmission and scanning types, as regards nervous tissue in general, including tissue culture, is also needed.

In neurophysiology a fascinating problem is the evolution of knowledge of nerve conduction. It is an excellent example of how contemporary nonbiological data were, and still are, used in an attempt to elucidate a biological phenomenon; it serves as a sensitive barometer of changing background concepts (Clarke 1968b). Thus there has been a sequence of proposed mechanisms, including spiritous, chemical, mechanical, electrolytic or electrical processes. The relationships with technology are obvious enough with the

application of instruments and techniques which have made further advances possible. The detailed study of this complex pattern of development has yet to be tackled.

There are many fascinating parts of the history of cortical localization and one that has been investigated to some extent is phrenology. The scientific aspects have received some attention and the originator of the cult, Dr F J Gall, an outstanding neuro-anatomist, has also been dealt with (Critchley 1965). The phrenologists believed that the surface of the brain was parcellated functionally and were, of course, eventually proved to be correct although for the wrong reasons. An analysis of the widespread popularity of phrenology with its repercussions in society, politics, literature, and science, quite apart from in medicine generally, would provide an excellent contribution to the history of nineteenth century thought and social behaviour (cf. Temkin 1947).

A history of the cerebellum would be equally useful but has not yet been attempted. As Dow & Moruzzi (1958) have pointed out, it illustrates well the way in which a study of recent scientific developments can indicate the lines of research which are likely to be the most profitable in the future, in this instance regarding the physiology of the organ. The history of cerebellar function is a long one, with its beginnings in Graeco-Roman antiquity, and it includes the suggestion by the phrenologists that sexual activities are mediated by it; before we pour scorn on this we should recall the genital atrophy in cases of Gordon Holmes' familial cerebellar degeneration (Holmes 1907).

Concerning the history of clinical neurology, a consideration of the evolution of the subject as a specialty of medicine first of all needs attention. Here medical, scientific, technological and social factors are involved and the way in which their interrelationships have determined the history of neurology in each country is of considerable significance, not only as a historical exercise but also as a means of determining plans for the future of the discipline. National and international comparative studies are needed and these must include a consideration of neurosurgery, neuropædiatrics, neuropathology, neuro-radiology and the other ancillary and supporting subspecialties. As in the case of histories of neurological institutions, narrow parochialism must be avoided and lack of progress as well as progress must be accounted for.

Only one neurological disorder, epilepsy, has been investigated historically in detail (Temkin

1945) but only as far as Hughlings Jackson in the 1870s. There are, of course, briefer accounts of other diseases but a careful and complete study of a condition like apoplexy, carried out for only the early Greek period as yet (Clarke 1963) is a very large undertaking. Neurological symptoms must also be considered, but the only one that has attracted any degree of attention so far is aphasia (Head 1926, Marx 1967). The patient likewise must not be overlooked, and a historical survey of the epileptic, the brain-injured, the neurosyphilitic, the paraplegic and others, taking into account all the personal, social and scientific factors, would be well worth while. Included here would be accounts by patients of their neurological diseases, as for example that of Augustus d'Este who gave a personal account of disseminated sclerosis before it was identified as a clinical entity by physicians (Firth 1941, 1948). The representation of patients in literature, art and other forms of expression, together with diseases of famous patients, recently illustrated brilliantly by McAlpine and Hunter and their colleagues (*British Medical Journal* 1968) in the case of George III's chronic illness presents a large field of study.

The biographical approach is one of the most fascinating parts of medical history but to depict accurately and fairly a man's life and contributions is a very difficult task, demanding a detailed knowledge of his work, of the endeavour that has preceded his, of his overall contribution to his special field whatever it may be, and of many external factors influencing him. A number of outstanding individuals in the neurological sciences are still awaiting their biographers. Hughlings Jackson is only one example and here the task of dissecting out the main concepts from his complicated writings is a challenge indeed. The technique of 'oral history' whereby modern audiovisual methods of recording interviews with famous individuals are used to build up an archive of historical material, not only on their own work but also on that of others, must be mentioned here. A recent example concerns the life of Tom Rivers, a virologist who was concerned with the development of poliomyelitis prophylaxis (Benison 1967).

A related problem is the collection, preservation and cataloguing of the personal papers of individuals of renown in the neurological sciences so that their laboratory notebooks or case histories and their letters, &c., could be made available for immediate or future historical research. Even representative pieces of their scientific or clinical apparatus should be conserved.

Finally, the gradual accumulation of photocopies or reprints of classical contributions to the neurological sciences is nowadays possible. In this way a remarkably useful collection of primary source material for teaching or research is provided and this ready access to original historical writings can eliminate the slavish and laborious copying of other writer's citations from classical works, with all the attendant chances of error.

Here then is a survey of some of the work proceeding or needed in the history of the neurological sciences, a veritable research protocol for the future. The professional historian of medicine can tackle a proportion of the topics mentioned but when it comes to the technical details he must be joined by neurological experts, the persons practising the subject the historian is investigating. It seems therefore that there is a large amount of historical work available for all of us.

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## Rehabilitation of the Brain-injured

Dr Jennifer H Steadman  
 and Dr J G Graham  
 (Department of Neurology,  
 Royal Infirmary,  
 Cardiff)

### Head Injuries: An Analysis and Follow-up Study

The planning of facilities to care for head injuries demands the accurate definition of the problem facing medical services, in terms of both numbers and severity. Many series of head injuries have been published, most of which have dealt with selected populations. The series reported by Russell (1934) was studied at a time when hospital admission of head injuries was in itself a criterion of severity; that published by Russell & Smith (1961) was exclusively of Service personnel, and Miller & Stern's (1965) patients were all seen for medicolegal purposes. The present study was designed to state the problem presented to a teaching hospital in the course of one year, in terms of the immediate situation and of the situation five years later.

### Material and Methods

Four hundred and eighty-four patients admitted to the Cardiff Royal Infirmary in 1958 were classified as head injuries in the diagnostic index. The case records of these 484 patients were studied and five years later, in 1963, a study of the current medical and social status of these patients was started. Data from both investigations, the study of inpatient records and the follow-up study, were transferred to punch cards and tabulated. Difficulties of selection arise in all series of this type but we have reason to believe that selection played a minimum part in this series. The patients were admitted almost exclusively via the Casualty Department, which is one of two such departments in the City of Cardiff and for several miles around. These departments are equidistant from the City Centre and are situated on the main route through the city. The selection of head injury as the diagnosis may have allowed the escape of some cases of head injury whose other injuries formed the dominant problem. The total may therefore be an underestimate.

Wherever possible information for the follow-up study was obtained by personal interview